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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MILLER, PATRICK L

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 12/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/052,517

Applicant(s)

BRUZY ET AL.

Examiner

Patrick Miller

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 1-9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

- Page 5, lines 13-20 cite Figure 1 as conventional.

Claim Objections

2. Claims 1-9 are objected to because of the following informalities: See bullets below.

Appropriate correction is required.

- Claims 1-9 all misspell the word "characterize".
- Claim 1 cites "the requirements for torque delivered..." (Page 13, lines 6-7). There is a lack of antecedent basis for this term. Examiner suggests deleting "the".
- Claim 1 cites "the drive frequency" (Page 13, line 8). There is a lack of antecedent basis for this term. Examiner suggest changing "the" to "a".

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 and 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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- Claims 1, 7, and 8 are generally narrative and indefinite, failing to conform to current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.
- Claim 7 recites two occurrences of the term “a means” (120) (page 14, line 10). It is unclear if the applicant is referring to the same “means”. Please clarify.
- Claim 8 cites the term “a means” (page 14, line 19). It is unclear if this “means” is referring to the same “means” cited in claim 7. Please clarify.
- Claim 9 cites the term “it” (page 14, line 29). It is unclear as to what the applicant is referring. Examiner suggests changing the claim to read as follows: “Motor-vehicle air-conditioning installation according to Claim 7, wherein the installation comprises at least one actuator”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 7 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizuno (6,073,689).

- With respect to claim 7, Mizuno discloses a flap actuator for a motor-vehicle air-conditioning system (Col. 1, lines 4-10), comprising a stepper motor for driving the flap (Col. 1, line 18), an electrical power-supply circuit for the motor (Col. 6, lines 44-46), a control input (Fig. 1, #24), a control unit linked to the control input and the electrical power supply (Fig. 1, #26), the power supply delivers a power-supply voltage at a given frequency in response to an actuator command (Col. 6, lines 55-67; drive signal is sent at 250 or 166 pps (pulses per second)), means to supply the control unit with torque information (Control unit [Fig. 1, #26] determines the torque level and performs processing according to Fig. 4, Step 310), and the control unit comprises a means for adapting the drive frequency of the stepper motor in regards to the torque requirements (Col. 8, lines 33-36, Control unit [Fig. 1, #26] changes the frequency from 166 pps to 250 pps and from 250 pps to 166 pps depending on torque requirements).
- With respect to claim 9, the motor-vehicle air-conditioning system has three actuators (Fig. 1, #'s 28, 29, 30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno (6,073,689) in view of Boillat (4,791,345).

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- With respect to claim 1, Mizuno discloses a method for controlling a flap-actuator stepper motor for a motor-vehicle air-conditioning system (Col. 1, lines 4-10), the method comprising: continuously gathering information representing requirements for torque delivered to the stepper motor, the drive frequency is reduced in response to a detected increase in torque requirements, and the drive frequency is increased in response to a detected decrease in torque requirements (Col. 6, lines 55-67; Col. 7, lines 1-2).
- Mizuno does not disclose increasing the drive frequency if the drive frequency is below a maximum frequency (Claim 1) and the stepper motor is initially ordered to a predetermined maximum frequency (Claim 2).
- Boillat discloses initially increasing the drive frequency of a stepper motor until the frequency reaches a maximum drive frequency limit (Col. 6, lines 52-54). The motivation to increase the drive frequency to a maximum drive frequency limit at initialization is to provide a steady and continuous increase in drive frequency, and the limit is provided to keep the torque from decreasing too much (Col. 6, lines 43-51). Since the initial drive frequency increase is smooth and the maximum drive frequency is limited, this provides the advantage of preventing the motor from vibrating and eliminates noise.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Mizuno so that upon initialization, the drive frequency proceeds to a maximum drive frequency and the drive frequency may not be increased above the maximum drive frequency limit, thereby providing the advantage of reduced motor vibration and noise, as taught by Boillat.

6. Claims 3, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno and Boillat as applied to claim 1 above, and further in view of Holdaway (6,016,044).
- Mizuno and Boillat teach all of the limitations of claim 1, but with respect to claims 3 and 4, do not disclose varying the drive frequency in a near-continuous way (claim 3) and in steps (claim 4) as a function of the detected torque requirements. Additionally, with respect to claim 6, Mizuno and Boillat do not disclose the torque requirements being representative of the instantaneous torque delivered to the motor.
 - With respect to claims 3 and 4, Holdaway discloses driving a stepper motor in both a near-continuous mode (micro-step) and a full-step mode. Holdaway's motivation for using a near-continuous mode (micro-step) is to exponentially increase the motor's drive frequency. Further, Holdaway's motivation for providing a full-step mode is to maintain the motor at maximum speed [Abstract]. The two modes disclosed by Holdaway provide the advantage of reducing noise during acceleration and reduced power consumption during constant frequency operation (Col. 2, lines 6-38).
 - With respect to claim 6, Holdaway discloses torque values represented as instantaneous torque. The motivation for detecting instantaneous torque is because while operating in the micro-step mode, a lower instantaneous torque generates an angular acceleration at the leading edge of each "micro-step" smaller than would be generated in full-step mode. This provides the advantage spreading the large acceleration that normally occurs at the beginning of each step over the entire step as a series of small accelerations, thus reducing the level of acoustic noise (Col. 2, lines 16-22).

- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Mizuno and Boillat so the stepper accelerates in a micro-step mode (near-continuous), operates at maximum frequency in a full-step mode, and the measured torque is in terms of instantaneous torque, thereby providing the advantages of reducing excess noise during acceleration and reducing power consumption when operating at maximum drive frequency, as taught by Holdaway.
7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno and Boillat as applied to claim 1 above, and further in view of Bartel (5,762,384).
- Mizuno and Boillat teach all of the limitations of claim 1, but with respect to claim 5 do not disclose the motor fed in an over-powered mode.
 - Bartel discloses a stepper motor that uses a drive power larger than the rated power of the motor, thus making the stepper motor fed in an over-powered mode. Bartel's motivation for driving the stepper motor in an over-powered mode is because the stepper motor is not permanently energized (i.e. energized by pulses) (Col. 2, lines 37-50). This provides the advantage of allowing for transient surges.
 - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Mizuno and Boillat so that it is fed in an over-powered mode, thereby providing the advantage of allowing for transient surges, as taught by Bartel.
8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno (6,073,689) as applied to claim 7 above, and further in view of Boillat (4,791,345).

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- Mizuno teaches all of the limitations of claim 7, but with respect to claim 8, does not disclose increasing the drive frequency if the drive frequency is below a maximum frequency.
- Boillat discloses increasing the drive frequency of a stepper motor as long as the driver frequency is below a maximum drive frequency limit (Col. 6, lines 52-54). The motivation to only increase the drive frequency to a maximum drive frequency limit so the torque will not be decreased too much (Col. 6, lines 43-51). Since the drive frequency is limited, this provides the advantage of preventing the motor from vibrating and eliminates noise.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Mizuno so the drive frequency can only be increased if below a maximum drive frequency limit, thereby providing the advantage of reduced motor vibration and noise, as taught by Boillat.

Prior Art of Record

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - Poehlein (5,107,194) discloses using the input to a stepper motor to drive the motor at different speeds, depending on the torque required to drive a load.
 - Narazaki (6,462,503) discloses a drive control system where the drive frequency is inversely proportional to torque.
 - Ido (4,254,368) discloses a stepper motor that reaches a frequency limit quickly upon start-up.

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- Suzuki (5,396,869) discloses a stepper motor that operates in a micro-step mode (near-continuous) and a step mode.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 703-308-4931. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on 703-308-3370. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Patrick Miller
Examiner
Art Unit 2837

pm
December 11, 2002


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